3652 4/22/03 #49

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: L.Gurevich, et al	**GAU: 3652**
SERIAL NO: 09/981,247	**EXAMINER: E.W. Underwood**
FILED: October 16, 2001	**St. Louis, Missouri**
FOR: Modular Robotic Device and Manufacturing System	**Date: March 31, 2003**
	DN: 7210

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on 4-3-03

Attorney

4-3-03

Date of Signature

Hon. Commissioner for Patents and Trademarks
Washington, DC 20231

AMENDMENT A

Sir:

This is in response to the office action dated December 16, 2002.

Please amend the specification to as follows:

Please amend page 14, line 7, as follows:

A1

Turning to FIGS. 1-4, another single-axis modular unit M is assembled in a frame 20 to move a plate 21 in one direction. In this instance, the modular unit M includes a pair of parallel side members 23 which are spaced apart by end members 25. Slide rails 7 are mounted on the side members 23; two slides 9 are placed on each slide rail 7; and the plate 21 extends across, and is mounted to, the top surface of each of the slides 9. The module M is supported above the ground by legs 27 which have feet 28 at the bottoms of the legs ~~25~~ 27. An opened case 29 surrounds the plate 21, and includes four vertical members 31 extending up from the ends of the side members 23; a first pair of horizontal members 33 extending between the vertical members 31 above the side members 23 and; and a second pair of horizontal members 35 extending between the vertical members 31 above the end members 25.

Please amend page 20, line 20, to as follows:

Turning to FIG. ~~12~~ 13, the control cables 17a-c from the actuators 1a-1c place the actuator controllers 15a-c in communication with the computer C. Instructions from the remote computer C are sent to the dedicated controllers 15a-c to move the respective positioning rod 13a-c along their respective slide rails 7a-c. In this configuration, the remote computer C can position the plate 61 of the unit 60, and any object attached to the plate 61, in a desired location in a three-dimensional Cartesian space, by directing each of the modules M2, M3 and M4 to move their respective positioning rods 13a-c to a desired position. The distance the plate 61 can translate in any given direction is only limited by the length of travel available from the module that provides that direction of travel in the unit 60.

A2

Please amend page 21, line 15, line 19, and line 22 to as follows:

The units 30 (FIGS. 5-8) and 60 (FIGS. 9-10) are modular units. Because the units are all constructed using the extruded members 3, the units can be assembled together. A robotic assembly system or unit 100 is shown in FIG. 11 which includes the units 30 and 60. The units 30 and 60 are positioned about a conveyer system 110. In the unit 100, a tray 112 moves along the conveyor to be positioned beneath the assembly 60. The unit 30 is used to load product P onto the rake 31. The unit 60 then moves a collector or gripper 114 which picks up the product P from the rake 31, (see also FIG. 12) and then deposits the product P in openings in the tray 112. Once full, the tray 112 is moved out from under the unit 60 by operation of the conveyor system 110. As can be appreciated, the computer C moves the rake 31 of unit 30 so that it can be properly filled with parts. The computer C then operates the unit 60 to raise, lower, and move the gripper 114 to pick up the product P from the rake 31 and then transport and deposit the product P on the tray 114.

A3

In FIG. ~~13~~ 12, a system or unit 200 is shown which includes several sub units, including the units 30 and 60, a pair of adjacent conveyors 210 and 212, and additional modules or units 220 and 240 (both of which are three-axis modules). The units 100 and 200 demonstrate how, using standard extrusions and interconnected linear actuators, separate units can be constructed, connected together, and integrated with each other to develop a production line in which product P is transported according to a predetermined pattern. Because the units are all made from the same parts, special pieces and special assembly techniques are not required. Hence, the cost and time to develop and build a unit, such as the unit 100 or 200 can be reduced.

A3